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THE AMBULANCE IN CIVIL LIFE

AND THE

Proceedings of the Metropolitan Street
Ambulance Association

BY

REGINALD HARRISON, F.R.C.S.

*President of the Association; Knight of Grace of the Order of St. John of
Jerusalem in England; and formerly (1864-89) Medical Officer of
Quarantine, H.M. Customs, Liverpool*

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PREFACE.

THIS pamphlet contains the sixth edition of an address I delivered in 1881 as President of the Liverpool Medical Institution. It was shortly followed by the employment by the Liverpool Police of improved hand ambulances or litters for accidents and street casualties requiring removal to hospital or elsewhere.

Later on these were supplemented by horse ambulances, which have now been used since 1884, with great advantage to the entire community. They have been the means of preventing much suffering, of saving innumerable lives, and of withdrawing from public gaze many distressing and unnecessary sights.

This issue differs from those which have preceded it by opening with an account of the efforts that are being made by the Metropolitan Street Ambulance Association to secure for the County and City of London an improved ambulance service, such as

Preface

smaller cities at home and abroad have long enjoyed.

It is hoped that these efforts may shortly be successful, and the opprobrium be removed by the provision for London of an efficient and up-to-date street ambulance service, which is just as necessary for the protection of the lives and safety of the entire community as fire brigades and engines are for their property.

6, LOWER BERKELEY STREET, W.

August, 1904.

The Ambulance in Civil Life.

THE METROPOLITAN STREET AMBULANCE ASSOCIATION.

THAT no adequate organisation exists for dealing with accidents and medical casualties in the streets and public places in London by the concerted action of the Police, telephone, hospitals and ambulances up to this date, is an anomaly which is difficult to understand, whatever the explanation may be.

The number and condition of persons arriving at our hospitals for treatment in these circumstances is conclusive evidence of the urgent necessity for action in this matter.

Quite recently various steps have been taken to bring this reform about, without prejudice to what had previously been done by associations and individuals in promoting ambulance work, which will presently be referred to.

In January, 1904, at the instance of Dr. Arthur James, the Metropolitan Street Ambulance Association was formed, and shortly afterwards I was asked to be President.

Sir William Church, Sir E. Cooper Perry, Mr. Anthony A. Bowlby (Treasurer), Surgeon-General Keogh, Mr. Raymond Johnson, Dr. H. D. Rolleston, and Mr. Cuthbert Wallace formed the Council, with Dr. Arthur James as Honorary Secretary.

The Metropolitan Street Ambulance Association's members are composed of the President and many of the Fellows of the Royal College of Physicians of London ; the President, the two Vice-Presidents, and most of the Council of the Royal College of Surgeons of England ; the Vice-Chancellor of the University of London ; practically the whole staff of each of the London hospitals and prominent medical men from every district in London and from many of the provincial towns. Amongst them may be mentioned : Lord Lister, Sir Thomas Barlow, Sir William Bennett, Sir T. Lauder Brunton, Sir J. Crichton-Browne, Sir Anderson Critchett, Sir Alfred Cooper, Sir W. S. Church, Sir Dyce Duckworth, Sir Joseph Fayrer, Sir Alfred Fripp, Sir William Gowers, Sir Henry Howse, Sir Constantine Holman, Sir Victor Horsley, Sir Francis Laking, Sir Patrick Manson, Sir Isambard Owen, Sir E. Cooper

Perry, Sir R. Douglas Powell, Sir James Reid, Sir Felix Simon, Sir Thomas Smith, Sir Hermann Weber, Mr. Timothy Holmes, Mr. A. Willett, Mr. Clinton Dent, Mr. Makins and Mr. H. W. Page.

The objects of the Association were defined as "endeavouring to secure for London, with as little delay as possible, an efficient street ambulance service, and further to promote the movement elsewhere in various ways."

It was thought that effect to the latter object might be given by the Association encouraging the provision of ambulances in every community, both small and large, at home and in our colonies, and in providing the necessary information upon which action might be taken relative to dealing with accidents and medical casualties occurring in streets and public places of resort. In beginning its operations in London the Metropolitan Street Ambulance Association recognised from its commencement the necessity (1) of bringing into unison the constituent parts of such an ambulance service as the state of the streets and public places of London seemed to require, and (2) by the introduc-

tion of the horse ambulance into this service, to provide the most improved method of rapid transit which experience showed was now urgently required.

In giving prominence to these two objects, the Association is anxious to emphasise the fact that in dealing with street accidents and medical casualties, rapidity of action and speed are perhaps more essential in bringing skilled assistance and appliances *to the injured person at the scene of the accident*, than in taking him away to the hospital or home for further treatment after this assistance has been applied on the spot.

When hand litters and stretchers have to be sent for, and wheeled or carried to where they are wanted, valuable time and opportunity are frequently lost. It is from this point of view that these appliances have for the most part failed to meet the extreme urgency connected with the treatment and management of the more serious cases of accident and emergency that occur in the streets.

In New York and Liverpool, for instance, the horse ambulance, definitely summoned by the police and replied to by telephone,

starts and arrives with all its accessories, in the shape of aid and appliances, at the scene of the accident within a few minutes, or perhaps seconds, after the accident has happened. No time is lost in searching for anybody or anything, as I have myself frequently seen at the places mentioned. There is no bustle or excitement ; all is quietness, and prompt action for a single and well-defined purpose.

Assistance having thus been obtained, it should further be remembered that it is part of the business of the skilled attendant who accompanies the horse ambulance to regulate at discretion the speed at which the conveyance with its patient *returns to* the hospital or home.

It is from these two aspects that the element of speed comes into prominence. The arrival and return of the ambulance are two quite different parts of one act, and are obviously determined by conditions that may differ widely.

I believe that the general hospitals of London could arrange to supply a sufficient number of advanced students to man these horse ambulances with the same efficiency,

zeal and benefit as they bring to bear upon their work as assistants, dressers and clinical clerks at the various institutions of this kind. A portion of the fifth year of study now required might even be made to include a few weeks' service in the ambulance department of a hospital, for which a certificate could be granted by the authorities.

I know of many students who look back with feelings of pleasure and pride at the experience gained, and the time they spent in the ambulance department of a hospital.

A volunteer corps could be raised from these ambulance attendants, which in case of war would prove of great assistance to this country.

The Association proceeded with its work without delay. Its first general meeting is thus reported in the *Lancet*, May 7, 1904 :—

"A general meeting of the Metropolitan Street Ambulance Association was held at the Royal Medical and Chirurgical Society's Rooms, 20, Hanover Square, London, W., on May 2nd, the chairman being Mr. REGINALD HARRISON, who in his opening remarks said that the Metropolitan Street Ambulance Association had been founded in January, 1904, by some members of the medical profession practising in London, who appointed a President and Council to initiate its proceedings.

“ The objects of the Association were to endeavour to secure for London, with as little delay as possible, an efficient street ambulance service for accidents and medical casualties, and, further, to promote the movement generally in various ways. That action had been taken not with any idea of undervaluing or supplanting efforts that had been made by persons and bodies to promote and to provide ambulance work, but, on the contrary, the Association had all along recognised the importance of the voluntary work that had been done, particularly by the St. John Ambulance Association, and by Mr. H. L. Bischoffsheim, in addition to the first-aid services rendered by the Metropolitan and City Police. The Association, however, felt that the influence of a large and united body of the medical profession, practically acquainted by daily observation with existing ambulance services for the streets, and holding definite views as to how these might be improved, was likely to afford valuable assistance to the authorities of the Metropolis and the country in bringing arrangements relative to that important subject to a definite issue.

“ Within a short time after its formation more than 1,000 members of the profession, engaged in hospital and private practice, had joined the Association on those broad lines, and they were met together to-day for the purpose of giving effect to the programme thus announced and so warmly responded to.

“ If further testimony in support of the objects of the Association was required, it would be found in the words of Sir E. C. Perry, of Guy's Hospital, in his report to the London County Council : ‘ That it was very painful to watch the arrival of accidents at hospitals under the present system ’ ; and also in the statement of Sir W. J. Collins, Chairman of the Ambulance Sub-Committee, in his prefatory note to the same report : ‘ That nearly

70 per cent. of the casualties at present conveyed to hospitals by some vehicle or other are taken in cabs and carts and not in ambulances.' On that latter basis it had been calculated that from 8,000 to 10,000 severe accidents were taken to London hospitals and elsewhere annually in cabs or in other unsuitable conveyances.

"It had to be remembered that those figures mainly represented persons constituting a large mass of the population—artisans and labourers—who were the most liable, by reason of their occupations, to sudden accidents; those, in fact, who were least able to provide for emergencies of that kind, and who, along with their families and dependents, suffered the more when thus overtaken, and especially when, from lack of proper attention at the time of the accident, their recovery and wage-earning power were unnecessarily delayed. On the other hand, it was not to be forgotten entirely that the well-to-do citizen of Greater London might in like manner be suddenly struck down and rendered unconscious in the street, and thus have cause to remember with gratitude the preservation of his life or limb by the timely arrival of a well-equipped ambulance at the moment when the bystanders were wondering who he was and where he came from.

"The present state of the London streets by the large addition of 'motor' and tram traffic was not calculated to lessen those liabilities. Relative to those statements, he would say that about 1881, in connection with the movement which resulted in the introduction of hand ambulances and subsequently of horse ambulances into Liverpool, he had made some extended observations as to what really happened to persons who 'were brought to hospitals in cabs and carts and not in ambulances.' He (Mr. Harrison) was at that time resident surgeon, and subsequently visiting surgeon,

to one of the largest hospitals in that city, which received annually many hundred accidents from the docks, city, and suburbs. He found that a large proportion of the fractures involving limbs which were originally simple had been rendered compound by improper methods, or the absence of methods, of removal to hospital, and, further, that where the injury or medical casualty had been attended with much shock, such, for instance, as in concussions caused by falls down a ship's hold or from aloft, in cases of severe burns and scalds, or by apoplectic, cardiac, and other seizures, by which persons were suddenly rendered more or less unconscious, the conveying of them in cabs or carts in a sitting position had not been infrequently followed by speedy death after their arrival at the hospital. The deaths of patients on their way to the hospital and within twenty-four hours after admission were often associated with that mode of conveyance. Thus an unnecessary loss of both limb and life could be accounted for.

"The entire absence of provision of horse and motor ambulances for street accidents in London also called for comment and action. Without those conveyances no system for a large city could be regarded as even approaching a state of efficiency. The number of horse ambulances required for the Metropolitan area could not at present be determined, and must be the result of experience. New York, with its population of over three and a half million people, seemed efficiently worked with about fifty-six of those conveyances. Though a proportion of street accidents in the immediate vicinity of hospitals were dealt with by hand ambulances or litters which were often used for other Police purposes, there could be no doubt that they compared unfavourably with the horse or motor con-

veyance which was a necessity when the distance to hospital was greater. Minutes, not to speak of seconds, were of the first importance, relative to antiseptic treatment, when a wound was present. Women who had met with accidents or other casualties in the streets, had often complained very bitterly of their recollections of the hand ambulance and their transit along crowded streets, though under the protection of the police.* Contrast that with their unobserved removal in a comfortable and smooth-running horse ambulance with a trained attendant by their side.

"The street ambulance service of London at the present time might be said to be carried on partly by the Police, as representing what was generally known as 'first-aid,' and partly by volunteer efforts. Whether a much divided authority was desirable, which that arrangement implied, without any guarantee for the continuance of efforts which were purely voluntary, was a matter deserving consideration.

"Whatever conclusion might be arrived at in reference to that point, it was obvious that the time had come when a central or undivided authority, which could bring into unison the various constituent parts of an ambulance, had become a necessity so far as London was concerned. The constituent parts of an ambulance included the Police as 'first aid' on the spot, the telephone, the conveyance and its motor power, the hospital or ambulance depôt, and the skilled attendant with appliances, all capable of concerted action for one object

* I have since been informed on good authority that persons often absolutely refuse to be taken to hospital on litters and hand ambulances. It must be obvious that in many casualties happening in the streets to women it is quite impossible to attend to them properly under the public gaze, whereas a horse ambulance affords the necessary privacy.

with as little delay as possible. When London could secure those conditions there would be no difficulty in providing it with an efficient and complete ambulance service. The Chairman then called upon the Secretary to state what steps had already been taken.

"Dr. ARTHUR W. JAMES, the Honorary Secretary, said that the late London County Council had done much to forward the Ambulance movement by the appointment of a Sub-Committee, under the chairmanship of Sir William Collins, and had issued a very valuable report in 1902. In consequence, it had been suggested, of the apparent indifference of the public no further steps had been taken in the matter.

"In those circumstances the Metropolitan Street Ambulance Association had been formed in order to secure the sympathy of all candidates for election to the new Council, and to interest the electors in a subject which so closely concerned every individual in the community.

"One hundred and ten medical men were appointed to act in the fifty-eight constituencies as local Honorary Secretaries, and these and their friends met with great success everywhere. Letters explaining the objects of the Association were sent to all the candidates with postcards for reply, asking each, 'If elected to the London County Council, will you interest yourselves in securing the establishment by the Council of an efficient street ambulance service for London?'

"Favourable answers were received in almost every case, the few exceptions being afterwards found chiefly among the unsuccessful contestants.

"Of the 118 newly-elected councillors, more than 104 were well-disposed toward the movement, and most of them knew that they could rely on the support in that matter of their constituents as well as of practically the

whole medical profession in the Metropolis. Many of those representatives were grateful for the manner in which that Association brought the subject forward, as it was well known that no public body could establish an ambulance service in London without first obtaining the sanction of Parliament. It appeared to be recognised generally that the community as a whole was responsible for caring for, and properly removing, those cases of accident and sudden illness which became helpless in the public streets, though there was still some difference of opinion as to which representative body should undertake the necessary provision and administration.

"Their Association was confident that the London County Council would accomplish that work better than any other central or local governing body, because of its representative constitution and because it appeared to have ready at hand such an efficient emergency service as the Fire Brigade. That brigade, with its ninety stations and resourceful staff of 1,350 men, already possessed almost all the administrative machinery necessary, and seemed to need little more than the addition of the required ambulances, horses, and men to make it an ideal ambulance service also.

"That addition of more men, especially in the smaller stations, would in all probability contribute greatly to the efficiency of the brigade, since just as firemen were now instructed in first-aid work, so those primarily employed in the ambulance service could be practised in fire-drill, and the two staffs made to a great extent interchangeable. In that manner both those emergency services would be mutually helpful, more efficient in consequence, and considerably more economical for London than any other arrangement.

"It was worthy of note that in Liverpool, which had

the best street ambulance service in England, and where the Police, the Fire Brigade, and the ambulance services were all under one management and worked together, the Fire Brigade machinery had been utilised for ambulance purposes. The drivers of the fire-engines were the drivers of the ambulances, and the fire-alarm posts had been used for ambulance calls without any inconvenience.

"Those points, which appeared worthy of consideration, induced the Council of their Association to make the following suggestions as the possible basis of a plan for providing London with an efficient street ambulance service.

"(1) That there should be one controlling authority responsible for a uniform and well-organised ambulance service, and that the London County Council, as the central representative body for the Metropolis, was the one best fitted to undertake the work.

"(2) That London should be divided into districts or 'accident areas,' and a properly organised ambulance service arranged in each. This would necessitate the establishment of horse or motor as well as hand ambulances.

"(3) That the Fire Brigade and the ambulance services could be most advantageously carried out conjointly.

"(4) That it was desirable that some of the ambulances under the control of the London County Council Fire Brigade should be stationed at, or in immediate connection with, the principal London hospitals.

"(5) That the Police should be kept efficient in first-aid training, and should be available, as at present, for rendering first aid to the injured, for summoning an ambulance, and for taking charge of the patient until the ambulance and attendant arrived, but should not

necessarily be expected to accompany a patient to home or hospital.

"(6) That the 1,000 fire-alarm telephone posts now existing and all other telephones should, if possible, be made available for calling the ambulances, and the Police should be instructed in their use.

"(7) That the experience gained in working such services for many years in New York, New Orleans, Chicago, Sydney, Copenhagen, Vienna, Paris, Liverpool, Bootle, Birkenhead, Manchester, Newcastle, Huddersfield, Bolton, Burnley, Hull, Sheffield, Leeds, and Wolverhampton was more than sufficient to justify the London County Council in undertaking the work in the Metropolis on a scale large enough to provide adequately for the 13,000 to 15,000 street casualties requiring removal each year.

"(8) That there should be no charge for the use of the ambulance.

"Dr. E. MARION COX said that from his experience of about 1,000 ambulance calls at a New York hospital, he was of opinion that in many surgical and medical cases much harm might have resulted if the patients had been brought to the hospital in the haphazard manner adopted in London. From 35 to 40 per cent. of the calls were for medical cases, the remainder being surgical. The ambulance was in the charge of hospital authorities, but it had to be remembered that in New York the hospitals were more widely distributed than in London. In New York they were accustomed to see a medical man accompanying the ambulance, but he did not think that that was necessary in London.

"Sir WILLIAM S. CHURCH, President of the Royal College of Physicians of London, then proposed the following motion :—

"That this Association, having considered the present

condition of ambulance provision in London for dealing with cases of accident and sudden illness in the streets and public places, is of opinion that there is urgent need of organisation under one body of an improved ambulance service, summonable by telephone, and provided with more rapid transport.'

"He said that there was great need for improvement in London of the ambulance provision for dealing with cases of accident and sudden illness in the streets and public places. The Metropolis in this matter was behind many of the larger provincial towns of England. The Association did not propose to initiate any scheme of its own, but sought to combine the existing agencies so that they should act harmoniously and under central control. It was considered that the Fire Brigade was the best body with which an ambulance service should be united, for the reason that such a scheme would be the most economical to adopt. Speaking as a physician, he knew from experience that the present system by which many of the patients were brought to the hospitals in cabs did not, in a great number of the cases, give them the best chance of recovery.

"Mr. TIMOTHY HOLMES, Consulting Surgeon to St. George's Hospital, in seconding the motion, agreed with the necessity for an improved ambulance service for the numerous accidents and cases of sudden illness that occurred in the streets of London. Under the present condition of things they must try to arrange for the conveyance of cases of accident or sudden illness to the hospital as safely and as quickly as possible.

"The motion was then put to the meeting and carried unanimously.

"Mr. JOHN TWEEDY, President of the Royal College of Surgeons of England, then proposed the following motion :—

“‘That, having regard to the excellent ambulance services organised by municipal authorities elsewhere, this meeting is of opinion that the London County Council is the body by which such service should be provided and maintained.’

“He said that there was no body so competent as the London County Council to undertake the scheme. The London County Council was not unfavourable to the proposal, and it was incumbent on those present to take care that public indifference should not be allowed to continue. The sympathy of the public must be stimulated, and the medical profession must give expression to a united opinion that some improved system was necessary. There was no intention to dictate to the London County Council, but the suggestion was made that the Fire Brigade seemed to be the best organisation to carry on the work, because it would provide the material and the *personnel* required for the efficient performance of the duties which would devolve on the ambulance service which they desired to see in London.

“Sir ALFRED COOPER, Vice-President of the Royal College of Surgeons of England, seconded the motion, which was then put to the meeting and carried unanimously.

“Sir THOMAS BARLOW, Physician to His Majesty’s Household, then proposed the following motion :—

“‘That the foregoing resolutions be communicated to the London County Council by deputation, and that the officers of this Association be requested to arrange for the co-operation and support of other representative associations and persons for this purpose.’

“He said that it must be evident to everyone that the ambulance service should be in the hands of a central official body with the power of levying taxes,

so that they could see that the work was properly done. Excellent as the various voluntary bodies were that interested themselves in the matter, it was obvious that they were not adequate to discharge the important and vital duties that lay before them. The London County Council was the right body to undertake the duty, and the medical profession should render every assistance to the London County Council. Any sanitary work that the London County Council had taken up had been well done, and in his opinion the Council would perform its duty in regard to the ambulance service in a proper manner.

"Mr. G. H. MAKINS, Surgeon to St. Thomas's Hospital and late Consulting Surgeon to the South African Field Force, in seconding the motion, said that it rested with the medical profession to impress on the public the importance of the movement which the Association had at heart. The ambulance service was an emergency service and so also was the Fire Brigade, and if the two could be worked on the lines suggested, there was no doubt that it would result in great advantage to the public.

"Mr. W. THORBURN (Manchester) said that in his town the ambulance service was entrusted to the City Council, and the details were arranged by the Watch Committee, which combined some of the functions of the Police and the Fire Brigade. The Fire Brigade found the horses and the Police force found the men. The improved ambulance service had been of the utmost value, and had been the means of saving much misery and suffering.

"The motion was then put to the meeting and was carried unanimously."

The next step taken by the Metropolitan Street Ambulance Association is thus stated

in the following extract from the *Times*, May 10, 1904 :—

“DEPUTATION TO THE LONDON COUNTY COUNCIL.

“An influential deputation was received by the General Purposes Committee of the London County Council yesterday afternoon in reference to the ambulance question, which has been brought prominently before the public during the last three months by the Metropolitan Street Ambulance Association. The following account of the proceedings has been supplied to us :—

“The deputation, which was introduced by SIR WILLIAM COLLINS, consisted of the following members of the Metropolitan Street Ambulance Association : Mr. Reginald Harrison, the President ; Sir William Church, President of the Royal College of Physicians of London ; Sir Alfred Cooper, Vice-President of the Royal College of Surgeons of England ; Sir Thomas Barlow, Physician to His Majesty's Household ; Sir Cooper Perry, Superintendent of Guy's Hospital ; Mr. Anthony Bowlby, C.M.G., Surgeon to St. Bartholomew's Hospital ; Surgeon-General Keogh, C.B. ; Mr. Raymond Johnson, Surgeon to University College Hospital ; Dr. H. D. Rolleston, Physician to St. George's Hospital ; Mr. Cuthbert Wallace, Surgeon to St. Thomas's Hospital ; Dr. R. Dudfield, President of the Metropolitan Branch of the Society of Medical Officers of Health ; and Dr. Arthur James, the originator and Honorary Secretary of the Association. The St. John Ambulance Association was represented by Lieutenant-Colonel Sir Richard Temple, Assistant Director of the Ambulance Department and Deputy-Chairman of the Committee ; Colonel Sir Herbert, C. Perrott, C.B., Chief Secretary.

Lord Knutsford, the late Director of St. John Ambulance Department, wrote regretting his inability to join the deputation, as he entirely sympathised with the objects desired by it. Mr. H. L. Bischoffsheim wrote expressing the hope that the result of the conference would be satisfactory, and regretting his inability to be present.

"Mr. REGINALD HARRISON said that he desired to thank the Council on behalf of the Metropolitan Street Ambulance Association for receiving the deputation, which, he thought he might say, represented public opinion on this matter of urgent importance to the whole population within the jurisdiction of the London County Council. The medical profession had undertaken to draw attention to this subject under a strong sense of duty to the community, arising out of their daily observations as to the state in which street casualties were at present removed to home or hospital. The medical profession in London were convinced that existing provision for dealing with such patients was quite inadequate, and compared most unfavourably with what existed elsewhere. They considered that the London County Council was the best authority to undertake the work, and they hoped that the Council would be able to see its way to obtaining the necessary Parliamentary powers with as little delay as possible, so that there should be no further loss of time when a definite scheme is decided on.

"Sir WILLIAM CHURCH read the resolutions passed at the general meeting of the Metropolitan Street Ambulance Association on May 2 (*vide* pp. 18-20), mentioning that these resolutions had been proposed and seconded by medical men of long and unique experience in dealing with the cases referred to. He pointed out that the Council of the Street Ambulance Association,

at their frequent meetings, had paid especial attention to the advantages of combining the Fire Brigade and ambulance services, and laid stress on the fact that there would be a very great saving of cost to the community by so doing.

"In answer to questions, he admitted that a street ambulance service is found to be of great value in quickly and properly removing to hospital industrial cases of accident and sudden illness, and thereby saving many lives, and, in regard to the four accidents per hour, day and night, said to occur in the Poplar Hospital district, he said that the proposed scheme would be of very great service.

"Sir RICHARD TEMPLE and Sir HERBERT PERROTT both assured the Committee that the St. John Ambulance Association quite approved of the proposals brought forward, and would do all in their power to help the work and assist the scheme.

"Dr. ARTHUR JAMES, in replying to questions, said that he hoped it was understood that in suggesting that the Ambulance and Fire Brigade services should be worked conjointly, there was no intention of putting more work on the present Fire Brigade staff, but rather that a sufficient number of men, horses and ambulances to deal with the 15,000 casualties requiring removal each year should be added to the Fire Brigade, and these extra men practised in fire-drill, so that they could be used for fire-work if required in the event of any unusual emergency. He mentioned that he considered that it would not be necessary to place ambulances at all the ninety fire-stations, but only in about thirty of them. He thought that, to begin with, an addition of two men, one horse, and one ambulance to each selected station would be enough, as most of them already had sufficient accommodation for this increase,

and only a few stations would require enlarging. Questioned as to cost, he said that it must be obvious to every one that there would be enormous saving of expense in utilising the Fire Brigade machinery, &c., and that experience of other cities proved that this could be done with actual advantage to each service, and that no inconvenience arose from using Fire Brigade telephones for ambulance purposes also. As regards the possibility of difficulty with the Police, because they were not under the control of the London County Council, he thought that there would be none, and that, with a well-organised ambulance service established in London on the occurrence of an accident the Police would naturally, as part of their duty, take charge, render "first aid," summon an ambulance, and on its arrival gladly hand over their patient, so that they could continue investigation as to cause, responsibility, &c., on the spot, and that the experience of Sydney and many other places proved how well the Police would co-operate with ambulance services, just as they now did with the Fire Brigade.

The next action taken by the Metropolitan Street Ambulance Association, in conjunction with the St. John Ambulance Association, was to interview the Police Committee of the Corporation of London. The account of these proceedings is taken from the *Standard* of June 30, 1904. I am indebted to the several speakers on the part of the two Associations for kindly putting in writing the substance of their remarks, and so enabling

me to present their opinions more fully than I could otherwise have done.

“DANGERS OF STREET TRAFFIC.

“*Deputations to the Police Committee of the Corporation of London.* Chairman: MR. ALDERMAN ALLISTON.

“The Police Committee of the City Corporation received, on June 29, 1904, two deputations—one from the Metropolitan Street Ambulance Association and the other from the St. John Ambulance Association.

“The first was composed of Mr. Reginald Harrison (President); Mr. A. A. Bowlby, Surgeon to St. Bartholomew's Hospital; Sir William Church, President of the Royal College of Physicians; Sir Dyce Duckworth, Physician to St. Bartholomew's Hospital; Mr. Raymond Johnson, Surgeon to University College Hospital; Surgeon-General A. H. Keogh; Mr. John Langton, Surgeon to St. Bartholomew's Hospital; Sir Stephen Mackenzie, Physician to the London Hospital; Mr. Charles Mansell-Moullin, Surgeon to the London Hospital; Sir E. Cooper Perry, Superintendent of Guy's Hospital; Dr. H. D. Rolleston, Physician to St. George's Hospital; Mr. Cuthbert Wallace, Surgeon to St. Thomas's Hospital; Mr. Golding Bird, Surgeon to Guy's Hospital; the Hon. Francis Dudley Leigh and Dr. Arthur James, Honorary Secretary.

“The second deputation consisted of the Marquess of Breadalbane, Lieutenant-Colonel Sir Richard Temple, Colonel Sir Herbert C. Perrott, Surgeon-General Sir Joseph Fayrer, Surgeon-General Sir W. R. Hooper, and Inspector-General B. Ninnis, R.N.

“Mr. REGINALD HARRISON, in addressing the Committee, said the Metropolitan Street Ambulance Association included a large body of medical practitioners,

and it was desired to urge upon the Corporation of London the necessity for providing a more efficient ambulance service for the City. Of the large number of accidents and medical casualties which daily occurred in the City, many were in connection with steam and electric machinery. The latter were frequently and increasingly the cause of what could only be described as the most frightful injuries and lacerations. It was specially desired, therefore, to urge upon the Committee the necessity for providing, with as little delay as possible, a more rapid and efficient service by the addition of horse ambulances to the existing appliances. By such conveyances not only could prompt and skilled attendance be brought to and applied on the spot where the accident occurred, but, if necessary, as often happened in serious hæmorrhage cases and wounds, could be given whilst the patient was in course of transit to the hospital. He anticipated that, as in other places where horse ambulances have been used for some years, there would be no difficulty in efficiently and economically manning the conveyances by advanced students connected with the City hospitals.

“Dr. ARTHUR JAMES said medical men were painfully aware of the fact that, under present conditions, not only did people die who might be saved, but some who would not otherwise die lost their lives entirely through the faulty method of their removal; while many others had their sufferings and their injuries greatly aggravated from the same cause. This condition of things was all the more to be deplored, because the remedies were so simple, and were so thoroughly proved in every other well-organised city. Thirty-five years ago all these points were thoroughly discussed in New York, with the practical result that a well-organised horse ambulance service was estab-

lished. The advantages of that service were so obvious that almost every large city in America soon followed that example, and gradually since then most of the best regulated cities of the world had adopted similar methods. The extensive experience of other large cities proved beyond question that for the successful working of an efficient ambulance service the following provisions were essential :—

“(1) That the Police should be kept efficiently trained in first-aid work.

“(2) That by means of telephones easily reached from the scene of any accident it should be possible to summon an ambulance, adequately equipped with the necessary appliances, and in charge of a skilled attendant.

“(3) That the ambulance should be stationed in a convenient place in touch with the hospitals, ready to start at very short notice, and able to reach the scene of an accident, accompanied by the skilled attendant, within a few minutes.

“(4) That the vehicle should be so constructed that the attendant could remain close to the patient, and be able to watch and administer treatment if necessary during the entire journey to home or hospital.

“Sir RICHARD TEMPLE said he was asked to speak for the St. John Ambulance Association, and desired to explain why the Association had joined in the deputation.

“There are four essential points in an effective ambulance—quickness, help *en route*, privacy, efficiency. In regard to quickness, a horse ambulance would easily beat a good litter in a crowded street. He had been himself in a cab which easily beat a quickly trundled litter, for which the traffic had made way in a crowded thoroughfare.

"With a horse ambulance a skilled attendant can travel with the patient and give assistance to any part of the body which is not possible with an open litter.

"A horse ambulance affords privacy. Patients, especially women, will very often not be carried in open litters, and the posture unavoidable in a cab is often most harmful.

"A horse ambulance is the most efficient kind for moving patients; for instance, in taking them up into the ambulance litter and out again and upstairs, as all this would be done by skilled persons.

"A horse ambulance possesses all the essentials of an effective street ambulance in a greater degree than a litter could.

"The speaker then related a story to illustrate the situation. He was in a hansom in a crowded street near Smithfield Market. A couple of police were well and quickly trundling a litter, looking like a St. John Ambulance litter, and the traffic, including the hansom, made way for it. Where the street widened the hansom went past the litter, and by the time it turned the corner the litter was far behind. On the litter was a young man, entirely unconscious, with his body covered over, but with his face uncovered, presumably for air. There was blood about the mouth. The whole circumstances seemed to the speaker to be so wrong, that he brought them to the notice of the Committee.

"Sir DYCE DUCKWORTH said: I should like to bear testimony to the importance of an improved ambulance system in respect of cases which come under the care of physicians. A large number of these demand attention. Patients may be suddenly seized with internal hæmorrhage, as for instance in cases of apoplexy, when it is of the most urgent importance that they be conveyed to a hospital or their homes with skilled care

and attention. An ordinary stretcher is manifestly unsuitable and even dangerous in such cases, and transference in a cab is even worse. The same may be said in regard to cases of syncope and convulsions, which require immediate and skilful attention. I think enough has been said already to prove that our system in London is both inadequate and out of date. I am proud to think that this matter has been effectively solved in my native city of Liverpool, where an admirable system of horse ambulance has been instituted with perfect success, and I am utterly ashamed to realise that here, in the Metropolis of the Empire, we are so far behind Liverpool and other cities in a matter so seriously affecting the well-being of our fellow-citizens. In our profession there is perfect unanimity as to the advisability of establishing without delay a well-equipped service of horse ambulances to meet the very pressing needs of to-day in this metropolis.

“Sir JOSEPH FAYRER said: I claim no special knowledge on the subject of ambulances, but long experience as a medical officer inclines me to believe that they are a most necessary adjunct to the Police arrangements of any great city. A common-sense view of the question induces me firmly to endorse whatever has been said in favour of horse-ambulances as distinguished from the ordinary litter. How any other view could be entertained, especially in reference to the question as it applies to this great city, I can hardly imagine. The idea that the litter was preferable may possibly have arisen out of economic views of the question, but I cannot see where economy should come in where life and death are concerned, and I should deeply regret to think that such an idea should be allowed to prevail in this great metropolis.

“I therefore fully endorse all that has been said by

the experienced men who have already spoken in favour of the horse ambulance. It has been pointed out that in the transit of the injured or sick person by a horse ambulance, safety to life as well as comfort in transmission is more likely to be assured, as a skilled attendant can then accompany the patient. Privacy and other advantages which are most essential are also secured, and it has been shown by the evidence of other cities that wherever the horse ambulance has been used it has proved its superiority over the litter.

"I therefore sincerely trust that the authorities concerned in this matter will be induced to adopt the horse ambulance so strongly recommended, and which has succeeded so well wherever it has been tried.

"Mr. GOLDING BIRD, speaking for Guy's Hospital, bore witness to the more than inconvenience to which street accident cases were subjected in their transit, under present methods, to the hospital; some, though fortunately not many, were even fatally affected thereby. He also bore witness to the improvements that had undoubtedly taken place in the course of years in street ambulance methods, one in especial being the introduction of the wheeled stretcher; but this lacked two essentials: one, the presence of a skilled person in attendance on the case, with the possibility of being able to put his skill into practice; the other, the utility of the vehicle to carry splints, dressings, or whatever might be requisite in first aid. These only could be obtained in a properly constructed horsed ambulance, where also necessary privacy could be assured. If these were all provided for, the question of rapidity of transit became of second importance, except so far as quickness of arrival was concerned. In urging the attendance of a skilled assistant, he did not wish to reflect upon the treatment and care administered by

the Police under present arrangements. He could bear witness to their tact, care and judgment in dealing with accidents; but their knowledge was limited, and appliances at their disposal more so.

"To the above reasons for the establishment of properly horsed ambulances for street accidents he would urge the moral one, that we could not ever stop short of doing the utmost and best for those who were suffering and committed to our charge; and this we could not possibly do under existing arrangements for those injured in the streets; and speaking for himself, he must add that he felt ashamed that this, the greatest city in the world, should be lagging behind others in its work of relief to suffering humanity.

"Inspector-General B. NINNIS, said that he considered an efficient ambulance service for London an imperative necessity; that the ambulance should be a waggon with room for appliances and splints as well as for a person of knowledge who could apply the appropriate remedies and properly attend to the patient, at the time and on the way to the hospital or home. For these and many other reasons a waggon was preferable to a litter, and was far more comfortable for the patient and attracted less attention. He thought the question of expense was made too much of. As an old naval medical officer, he had seen too many severe accidents not to know what was necessary, and he felt sure that if the authorities would only recognise the importance of establishing an ambulance service the details could be worked out, but of course this would take some trouble.

"Mr. ANTHONY BOWLBY said that from the surgeon's point of view it was not so much a question of rapid transit for the patient as of safe transit and a speedy arrival of the ambulance on the scene. The horse

ambulance had the very great advantage over the Police stretcher that it brought to the patient both skilled assistance and surgical appliances, and it also permitted the skilled assistant to travel with the patient. It was of the greatest advantage that the person who first saw the patient and applied the dressings and splints should also be able to inform the hospital surgeon of the nature of the patient's injuries, and thus save the removal of splints and the disturbance of the wound, which would otherwise be necessary to ascertain the nature of the hurt. In all cases of fracture of the leg and thigh it was of great importance to apply splints before removing the patient, and in all such instances it was equally necessary that the patient should be kept lying down during transit. Where much blood had been lost, the safety of the patient often depended on the recumbent position. Where bleeding was actually continuing, it was evident that the presence of a skilled attendant might be the means of saving life.

"Sir WILLIAM CHURCH said: I desire, Mr. Alderman Alliston, on behalf of the Metropolitan Street Ambulance Association, to express our thanks to you and to the Police Committee for having the kindness to receive us to-day, and to listen to what we wished to urge in support of this movement. I will not detain you by adding to the remarks which have fallen from the members of the deputation, but I should like to add a few words to what has already been touched by Sir Dyce Duckworth, and impress upon you, Sir, and the Committee, that although the street accidents are the feature that appeals most strongly to the public, my experience as a physician, attached for nearly forty years to the principal City hospital, has shown me the urgent need there is for proper ambulance accommodation for

medical cases. Persons are suddenly taken ill in the streets and other places, and irreparable harm is often done to them by the present mode of conveyance to their homes or hospitals. I refer especially to the frequent cases of cerebral hæmorrhage and hæmorrhage from the lungs and stomach. Medical cases as contrasted with accidents form a larger proportion of ambulance cases than is generally recognised, and I believe that from one-quarter to one-third of all serious cases brought to our own Metropolitan hospitals are admitted to the medical wards. I beg, on behalf of the Metropolitan Street Ambulance Association, once more to thank you for receiving us to-day."

In closing up to this date (July, 1904) my review of the proceedings of the Metropolitan Street Ambulance Association, I take this opportunity of cordially thanking the Press generally for recording so promptly and fully our proceedings.

To the editors of the *Lancet* and *British Medical Journal* our thanks are specially due, not only for presenting the profession with full reports of our meetings, but for editorial remarks and annotations of much value and interest.

It is a matter of satisfaction to the Association to note that neither in the lay or medical Press has a hostile or antagonistic criticism been provoked; on the contrary, the views

and actions of the Association have been throughout received with a degree of unanimity of expression which is rarely found in connection with great public questions of the day.

The Early Days of the Ambulance Movement in Liverpool.

IN the course of a second visit to the United States in 1881, undertaken for this purpose, I was much struck with the provision in some of their cities and hospitals for the conveyance of sick and injured persons from the streets and for their "first aid." I determined therefore, to make these observations the subject of my address as President of the Liverpool Medical Institution, in October, 1881, shortly after my return home.

When I came to compare what I had seen in America in connection with transferring injured persons to hospitals or their homes, with what prevailed in our own country, I recognised that we had much to imitate and learn which would effect a considerable saving of life and diminution in suffering.

The condition of London, for instance, at that time, for dealing with street accidents, is described in an article in the *British Medical*

Journal of July 16, 1881, as follows : " With the exception of a few ambulances for the use of the fever hospitals only, of a few others exclusively for conditional and pauper use, of some hand barrow ambulances recently supplied to some of the police stations, but which do not touch the question of prompt and skilful care, or of seclusion during removal — so highly desirable — the condition of London in this particular is one of absolute destitution. In the entire police department there is not one ambulance waggon. In the entire fire department there is not one ambulance waggon. In not one of the eighty-five hospitals referred to, is there an ambulance waggon." Nor was the condition of Liverpool any better.

The following portion of my address (which in response to many applications for it has been reprinted five times) will serve to illustrate what about that time (1881) might be witnessed daily at any of the general hospitals in Liverpool, as well as the means suggested and pressed upon the local authorities with ultimate success for remedying this state of things.

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A scaffolding gives way, and a labourer having fallen from a height, is rendered incapable of rising without pain ; a policeman arrives, and seeing that the man appears seriously hurt, places him in a cab, by which he is conveyed to the nearest hospital, possibly over a rough road, with all available speed. Then he has to be taken out of the cab—a more intricate business, which is usually effected by the policeman and a porter.

Not unfrequently patients may be seen with fractured and wounded legs hopping out of cabs to the hospital doors to avoid handling, the floor of the conveyance being covered with the blood of the unfortunate sufferer.

To follow the illustration, the resident surgeon, on the patient being placed on the couch in the receiving-room, recognises that he is suffering from a compound or open fracture about the ankle, the probable sequence of events being that the fall caused the fracture and the removal made it compound : that is to say, the sharp end of the fractured bone protruded through the skin, as a knife might do, for the want of attention and proper restraint *during the time the patient was being conveyed to hospital.*

This is a common way in which simple fractures are converted into compound ones, in addition to the production of other complications, such as the puncturing of blood-vessels and nerves and the bruising of tissues, sufficient even to produce mortification, by the uncontrolled action of the broken bones during removal.

Since the days of the immortal John Hunter, who gave prominence to the distinction between simple and compound fractures, surgery has endeavoured to imitate the one and avoid the other, whilst the object of "Listerism" is in the endeavour to artificially surround a compound fracture with those safeguards which are attached to the simpler variety. And yet in the present day the patient has often to thank the mode of his removal to hospital for the production of the chief difficulties and dangers that have also to be treated.

But to return to my illustration. If the patient was found so injured as to be physically incapable of being doubled up in a cab, a stretcher was procured, upon which he was placed, and the crowd entertained by the unnecessary sight of a man (or a woman)—often

presumed to be tipsy—being borne to the hospital by four men or so; a method certainly better than that of the less fortunate fellow-sufferer who took precedence in a cab.



In this figure, taken from a drawing made early last century (1828), the common method of taking injured persons to the Royal Infirmary is shown. It was in vogue for many years afterwards and was preferable to the cab which largely supplanted it. Both methods have for many years given place in this city to the Horse Ambulance.

I do not suggest that the police are wanting in humanity or thought in the execution of their duty; on the contrary, as a rule, I have been struck with their kindness and ability in

doing their best with the imperfect appliances the community place at their disposal.

Some years ago I was summoned to see two gentlemen who had their legs fractured on ocean steamers arriving at this port, where it was necessary they should be removed for further treatment. It could hardly be imagined how this would be done without material damage ; I have, however, a distinct recollection of the crowds we drew in the course of our journey with a couple of stretchers, which was something like a royal progress. So with an American lady of high position, who six days previously had miscarried on board a trans-Atlantic steamer. She had been removed to an hotel before my arrival, and I shall not forget the indignation expressed by her husband in reference to our resources for meeting this not unusual emergency. "I went everywhere," he said, "to procure such an ambulance as could be had in almost any of the smaller cities in the United States, but to no purpose ; the only offer was a conveyance for fever patients, with a promise that it was to be specially disinfected for the occasion." Eventually this lady was carried on a stretcher through the crowded streets—an ordeal never

to be forgotten, and which considerably retarded her recovery. I heard of another case where an injured lady was conveyed from the docks to her hotel on a mattress placed on the top of a four-wheeled cab !

There was a well-known instance of an elderly and highly gifted lady whom I attended through a prolonged illness followed by permanent lameness, who was rudely knocked down and had the neck of her thigh-bone fractured, as she was stepping out of her brougham. She was at once lifted from the ground by some bystanders, and pushed head and shoulders backwards into her carriage and driven to my house. On her arrival it was found that the lower fragment of bone had been forced upwards beneath the skin covering the buttocks. Such an amount of displacement is almost unique in the history of fractures about the hip-joint, and illustrates the great force that had been exercised in putting her rapidly into the carriage after the somewhat frail bone had been broken by the fall. It was a painful lesson in "first aid," and the cause of much subsequent and unnecessary suffering.

More recently I have read the record of

an instance where a distinguished surgeon met with a somewhat similar accident. Falling on his back on the pavement, and happening to have a stick in his hand, he hit out lustily as the bystanders approached him and waited patiently the arrival of an ambulance and its attendant, by whom he was safely and speedily taken to his home. He made a good recovery, and lived for some years afterwards.

To take another phase. Some years ago, when I was in the habit of conducting the *post-mortem* examinations at the Royal Infirmary, I happened to remark to the late Dr. Inman, one of the physicians, on the frequency these were made on persons suffering from heart disease, who, though they had been chronically ill, died within a day or so after their admission to hospital. His reply was that this was probably due to the way these persons were brought to the Institution. "Fancy," he said, "a patient with a heart complaint of some standing being suddenly placed bolt upright in a four-wheeled cab, and then driven a mile or two to the hospital, with the object of getting the best advice and treatment! What could

these avail in the circumstances such persons were admitted ? ”

And now we will turn from these painful cases to the remedy ; and for this purpose let me instance the ambulance arrangements at the recently constructed City of New York Hospital, and briefly notice what I was shown by Mr. G. P. Ludlam, the courteous superintendent of this hospital.

New York is divided into what are called police precincts, which are respectively assigned to the different hospitals with an ambulance service. The police have charge of all street accidents and casualties. On the occurrence of an accident or an emergency requiring medical aid, information is at once given by the policeman on duty in the street to the police station by telephone, and the hospital of the precinct is also informed that an ambulance is required, and where. In the hospital there are electric bells within hearing of the surgeon or the assistant, who is told off for ambulance duty, as well as in the driver's room and stables ; these are governed and are simultaneously acted on by a switch in the office where the telephone is placed and the messages are received. Taking a brief record

of the message, notifying the porter to open the gate, harnessing the horse, and starting the ambulance, occupies a very short space from the time the call reaches the hospital. Patent harness is used, which reduces the time necessary for this process to a few seconds, the horse being always in readiness for duty. The rules for the ambulance service are as follows :—

RULES FOR THE AMBULANCE SERVICE OF THE NEW YORK HOSPITAL.

1. Each ambulance shall be accompanied by a Surgeon and a Driver in uniform. The Surgeon shall be the Senior Assistant on the Surgical Staff.

(a) Transfer of patients in ambulance shall be made by the Junior Assistants of the House Staff, as indicated, and at hours to be designated by the Superintendent.

2. The Superintendent shall see that all calls for the ambulance are promptly responded to by both Surgeon and Driver.

3. On reaching the patient the Surgeon shall determine the nature of the injury or disease, administer such temporary relief as may be appropriate, and, except in the following cases, take the patient without delay to the Hospital.

(a) Cases of infectious or contagious disease are not to be brought in the ambulance, but, upon its return to the Hospital, must be immediately reported to the Superintendent, who shall forward the report at once to the Board of Health.

(b) Women in labour, if, in the judgment of the

Surgeon, their condition warrants their removal, are to be taken to a Maternity Hospital.

- (c) Cases of erysipelas, delirium tremens, and acute mania are to be taken directly to Bellevue Hospital.
- (d) If a patient or the friends request it, the case is to be removed to a private residence or another Hospital, if within a reasonable distance.
- (e) Patients whose injury or condition does not require professional attention beyond what is given by the Ambulance Surgeon on the spot.

4. A record book of the Ambulance Service shall be kept by the Surgeon, in which shall be noted the time when the call was made, that of reaching the patient and that of arrival at the Hospital, together with the name of the patient and place whence he was taken. When no case is brought the reason therefore shall be stated, and the name of the patient, whenever possible, be noted in the record book.

5. On arrival at the Hospital the Surgeon shall superintend the removal of the patient to the Reception Ward, and notify the House Physician or House Surgeon, according as the case may be a medical or surgical one, if, in his judgment, it requires the attention of the latter, or shall immediately administer such treatment as is necessary, and shall then before attending to any other duty make suitable entries in the Record Books in the office. The House Physician or House Surgeon, when summoned, shall, without delay, make a thorough examination, and assume the care of the case; if so professionally engaged as to be unable to do so when notified, he shall immediately notify his First Senior Assistant to attend to it. No patient shall be allowed to remain in the Reception Ward without such attention for the space of ten minutes. When the Junior Assistant is acting Ambulance Surgeon, he shall notify the House Physician or House Surgeon in every case.

6. In responding to fire calls, the Ambulance will go to such parts of the city as may be from time to time designated by the Executive Committee.

7. In responding to a call, the Ambulance should always be driven at a rapid, but never at a dangerous, rate. In returning, the rate should always be moderate, except when the patient must be brought to the Hospital without delay. The Surgeon in charge must always instruct the Driver in this respect.

8. Modifications of these rules can be made only by the Executive Committee, or temporarily by the Superintendent, to whom must be referred each case wherein the same are deemed necessary.

The ambulance is a neat, solidly-built, easy-running vehicle, provided with a sliding bed or stuffed cushion, which fills the body, and is pulled out to receive the patient, being dropped so as to lie at an angle, and pushed back into its place after the patient is put on it. The equipments of an ambulance for "First Aid" are as follow : Medicine chest, containing heart stimulants, sedatives, antidotes, emetics, dressings for burns, carbolic acid, spatula, dropper, medicine glass, rubber syringe, tumbler. Bandages — carbolised gauze and plain muslin ; cotton ; rubber tissue ; jute ; nine side splints ; two long thigh splints ; one rectangular tin splint ; one pus basin ; one pair of handcuffs ; one air cushion ; two pair pillows ; one stretcher,

with rubber protector, and three double blankets ; one box containing tourniquet, tracheotomy tube ; materials for blisters, dressing, and sponges ; one lantern ; one fracture box. The surgeon always carries his pocket-case of instruments.

Such is a brief sketch of the provision in America for this important service in connection with the "First Aid" treatment of injured persons or those suddenly taken ill. The late Dr. Sands, one of the surgeons to the City of New York Hospital, informed me that, in addition to the more apparent advantages of the system, he had no doubt that it had been the means of largely reducing the number and diminishing the severity of compound fractures, as all fractures were secured *on the spot*, before any damage could be done in moving the patient. It will be noted that the circumstances determining the probable progress of injuries of this kind are usually those immediately following their infliction, and are, for the most part, traceable to the movement of the fragments.

Hence it is of the first importance that the hospital should practically be brought to the place where the injured person lies, in order

that his removal may not be responsible for consequences which might have been avoided.

No city hospital can now be regarded as complete in its equipments for the treatment of injured persons which is not provided with its ambulance department. It may be thought that the expense attending this will prevail against its general adoption. I cannot think this objection will be seriously entertained even if it were so, when it is proved that, without such means, life is not unfrequently at stake.

There can be no doubt that the conditions under which patients are admitted to hospital considerably influence their subsequent cost to the Institution. Compound fractures and complicated injuries are more protracted and expensive to treat than simpler ones ; whilst patients whose injuries and sufferings have been aggravated by their mode of removal for treatment may be said to be in like case.

At the Northern Hospital, where the horse ambulance system was first tried in Liverpool (1884), Colonel Joynson states : * "It is [the

* "Horse Ambulances in Connection with Hospitals," being a paper read at a Meeting of the Hospitals Association, April 15, 1885.

hospital] of the capacity of 150 beds, and stands adjacent to the line of docks, where the most frightful accidents are of daily occurrence. During the year 1884 as many as 580 cases were conveyed. The average time from call to departure was two minutes by day and four minutes by night. The average time of each journey from call to return was eighteen minutes and thirty seconds." The expenses for this service for one year at this hospital are stated by Colonel Joynson to be as follows, viz. :—

	£	s.	d.
Drivers' wages at 24s. per week ...	66	6	0
Horse hire at 30s. ditto ...	78	0	0
Cottage for driver at 6s. ditto...	11	14	0
Rent of stable	20	0	0
Telephone	15	10	0
Livery for driver	6	6	0
Insurance	4	10	0
Repairs and sundries	25	0	0
	<hr/>		
	£227	6	0

A resident surgeon or dresser, who is usually on the staff of the hospital, accompanies the ambulance. Advanced students are very keen to hold these appointments just as they are to obtain dresserships and clerkships on the staff. In after life they greatly value

the special experience thus gained, and apply it in practice with much advantage. The ambulance here referred to was designed by Sir John Furley, and is built of English oak and American ash and birch. There is room in the interior for two patients. It is very well adapted for the purpose.

There is another aspect connected with the question of expense which should not be entirely overlooked. When nursing began to be systematically taught in this country, it was for the benefit of the poor in our hospitals ; subsequently, however, as the movement spread, not only did all classes share in the improvement that rapidly followed upon this better system of education, but nursing soon became a profitable employment.

So with the ambulance in civil life, though in the first instance organised in connection with hospital work, it will eventually spread in other directions, where it may be advantageously and profitably utilised.

What a boon such a means of transport would be to many invalids who feel that sea breezes and fresh air might be new life, yet shudder at the idea of what has to be undergone before these can be attained. We should

more frequently avail ourselves of convalescent homes if better provision in the way of conveyance were provided. Many more patients might be sent to them with advantage if this could be effected without damage.

The St. John Ambulance Association has for some time undertaken the removal of persons (infectious cases excepted) from and to all parts. It has an excellent staff of fully trained attendants and all the necessary appliances for doing this in the most approved manner at a reasonable cost.

Persons are not always as careful in hiring cabs and public carriages for the conveyance of those who have recently suffered from infectious disorders as they should be.* If they could readily obtain at a moderate charge a properly prepared ambulance from a responsible body it would be advantageous to everyone.

Some years ago an efficient ambulance service for this or any other large town, would have been impracticable, by reason of our imperfect and slow means of communication.

* The Metropolitan Asylums Board, Victoria Embankment, E.C., removes persons by ambulances specially employed for the purpose, who are suffering from infectious diseases.

Now, however, the streets are rapidly becoming invaded by a meshwork of telegraphs and telephones, and there are but few parts of our cities which cannot be readily brought, by these means, into actual touch with a hospital. The use of electricity, in some form or another, is daily becoming more general and the number of streets and houses possessing a telephone is greatly on the increase.

It is better to anticipate the application of modern inventions than to wait until this can no longer be resisted.

Liverpool, some years ago, under the auspices of the late William Rathbone, set an example to this country in training nurses for the sick, which has been productive of the best results. The measures here advocated are no less pressing, and it will be a matter of satisfaction to find that this large and progressive city is again to the fore.

As sickness and accident are liabilities to which we are all exposed, it becomes the duty of those whose office it is to prolong life and to alleviate suffering so to endeavour to direct the energies of the public as to render these contingencies as light in their incidence as possible.

It is to be hoped that when future generations look back at the astounding discoveries that have been recently made in almost all branches of practical science, they will be equally impressed by the attention that was at the same time paid to the care and comfort of the sick and injured.

Further information relative to ambulance work in large cities and amongst the civil population, will be found in the following publications :—

In the *Nineteenth Century Magazine*, October, 1896, the Hon. Francis Dudley Leigh contributes an important article on Horse Ambulances.

County Council Report (December, 1902) on the Ambulance provision existing in London and in Provincial and Continental cities and towns for dealing with cases of accident or sudden illness in the streets or other public places, with prefatory note by Sir William J. Collins, Chairman of the Ambulance Sub-Committee of the General Purposes Committee. This is a most interesting and instructive report, and contains much evidence, by medical men and others, pointing to the necessity for proper provision being made, and giving particulars of the working of horse ambulance systems, both in England and abroad.

It would be well for those interested in this subject to carefully study the excellent map of London giving the position of all the Fire Brigade Stations which might be utilised in connection with street ambulance work. It

is published in the Report of the Fire Brigade of the London County Council for 1903.

The *Windsor Magazine* for August, 1903, contains an excellent article by Mr. P. Heywood Hatfield, formerly Ambulance Surgeon in Liverpool, from the descriptive and popular point of view.

Our Hospitals' and Charities' Magazine for May, 1904, also contains an illustrated paper, entitled "The Removal of Street Accidents, London's Urgent Need of an Ambulance Service." This article is a well prepared one, and has special reference to the action of the Metropolitan Street Ambulance Association in advocating horse ambulances for London.

Report by Captain J. W. Nott Bower, Commissioner of the City Police, to the Police Committee of the City of London, on a Horse Ambulance System, February, 1904.

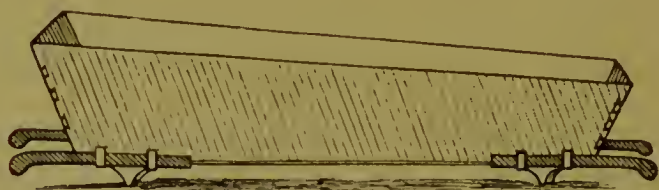
The Annual Report of the Chapter-General of the Grand Priory of the Order of the Hospital of St. John of Jerusalem in England.

ADDITIONAL INFORMATION.

The late Dr. Whittemore, resident superintendent of the General Hospital, Boston, Massachusetts, wrote me as follows in reference to their ambulance arrangements :—

"The ambulance is a plain covered vehicle, open at both ends, but with curtains that can be closed. The driver's seat is raised a few

inches above the body and under the cover. The length of the body is eight and a-half feet, and the width three and a-half feet. We use a stretcher like the rough sketch, which we prefer to canvas and rods, as it is firmer and much more comfortable for the patient. We use a thin mattress in it, and often make



Length, 5 feet 9 inches. Width, 24 inches at top, 20 inches at foot. Depth at head, 13 inches; at feet, 7 inches. Made of white wood, $\frac{1}{2}$ -inch thick. Movable handles, 36 inches long.

up a regular bed in transferring a patient from the house to the hospital. The stretcher is much easier for fractures, as after being put in there is no further movement until removed at the desired destination. The stretcher slides easily into the ambulance. The width allows it to pass readily through ordinary doors and into railway carriages. We are ready at all times with medical or surgical men, nurses, apparatus, and medicines."

Dr. Morton, of Philadelphia, writes me thus: "Our ambulance system of the Penn-

sylvania Hospital consists merely in our keeping a conveyance made for the purpose, and thoroughly adapted for careful transportation of the sick and wounded. Our hospital is connected with the fire and police stations, and by telephone with central stations. When the gatekeeper of this hospital receives notification, he at once despatches the ambulance, and sometimes in large fires (such as at mills—one occurred this week, when there was no fire-escape, and some twelve or more were killed outright, and many injured) we send it before being called upon. All the four surgeons are also connected by telephone with the hospital, so that much valuable time is saved by the rapid means of communication."

From CAPTAIN NOTT BOWER, *Commissioner of Police of the City of London; formerly Head Constable of Liverpool.*

City Police Office, London,

May 1, 1902.

DEAR MR. HARRISON,—Hearing that you propose republishing the pamphlet you issued many years ago on Horse Ambulance Systems, I think I ought to tell you of the enormous influence it exercised. I well remember the original issue, and also the great trouble you went to in interviewing the Liverpool

Watch Committee and pressing upon them the necessity for adequate ambulance provision. You were really the pioneer in the great work done in that part of England, which now possesses a system far superior (so far as I know) to that in any other part of the country. Liverpool now possesses a magnificent system, very similar to that of New York. Horse ambulances, provided at the cost of the Corporation, horsed and manned by the City Police, and attended by a Surgeon appointed from the Hospitals, stand always ready for turn-out at various Hospitals and Police Stations, each one serving a carefully mapped-out district of the City. The turn-outs in the year are numbered by the thousand, and the inestimable gain to patients is testified to by every Hospital and every doctor in Liverpool. Birkenhead and Bootle have adopted somewhat similar municipal systems in connection with their Fire Brigades, and these, like that of Liverpool, owe their existence to your advocacy to a very great extent. I enclose a paper by Surgeon-Major Hutton,* read at a meeting of the British Medical Association, which refers to the good service you did the Ambulance cause, and a copy of a report of mine (whilst Head Constable of Liverpool), giving details of the work of the Police Ambulance system there.

If you are adding anything to the pamphlet, they may be of use. Anyhow, you will like to know of the results following on the great interest you took in the question.

Believe me,

Yours very sincerely,

J. W. NOTT BOWER.

* *British Medical Journal*, September 8, 1900.

From the late SIR WILLIAM BANKS, LL.D., F.R.C.S.,
Consulting Surgeon to the Liverpool Royal Infirmary,

28, Rodney Street,

May 14, 1902.

MY DEAR HARRISON,—I can hardly believe it possible that twenty-one years have elapsed since you gave the address on the use of the ambulance in civil practice as an introductory speech at the Liverpool Medical Institute, of which you were at the time President—the address which you now purpose republishing for the fourth time. It imprinted itself on my memory, so that I remember the speech very well indeed. It was the first occasion on which a definite proposal had been made that the city should take charge of its injured citizens and convey them promptly to some place where they might receive medical assistance. I remember you had been struck with the system which you had seen on a visit to New York; we sluggish Britishers being a long way behind our American cousins in this, as, alas! we seem to be in most things.

At our Infirmary at present the police maintain a first-rate ambulance waggon and a man of the Mounted Police Section to look after it. It is ready for action in a few minutes. We, on the other hand, maintain a young surgeon, who is known as the Casualty and Ambulance Surgeon, and who goes out with the ambulance waggon. The city is divided into districts, and the great Hospitals are ready, by means of the police ambulances, to give help to injured people within an astonishing brief space of time. No little credit for this splendid state of things is due to yourself, and it is a great pleasure to me, as one of your oldest friends, that your efforts in this public

matter are still gratefully remembered by the city in which you spent the best years of your life.

I am, my dear Harrison,

Yours sincerely,

WILLIAM M. BANKS.

From MR. GEORGE P. LUDLAM, Superintendent New York Hospital.

February 2, 1900.

DEAR MR. REGINALD HARRISON,—Your esteemed favour of January 18 reached me in due course, as did also the pamphlet to which you refer. I have read the latter carefully, and its statements apply to the Ambulance Service of to-day as well as to that of the time when the pamphlet was written. If there has been any change, it would appear in the way of development and of a broader, more general line of administration. The service has come to be an absolutely essential part of hospital administration and an equally important and essential feature of city life.

While the relations between the hospitals and the police department remain as before in the matter of summoning the ambulance, yet the rapid growth of the telephone in modern business life has practically brought the ambulance service within the control of the general public, and we respond to a call, over telephone, from any source, when we have reason to believe the ambulance is actually needed.

The equipment remains also the same, that is, the vehicle is always prepared to deal promptly with whatever it may be called to, the details of medical and surgical supplies, of course, changing with the changing methods of treatment.



It may interest you to know the volume of business done by our ambulance during 1899.

At the main hospital:—

Number of calls	2,028
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Emergency cases treated by Ambulance Surgeon and not brought to hospital	245
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At the House of Relief (our down-town Emergency Hospital):—

Number of calls	3,510
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Emergency cases treated as above	2,088
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It will also give me pleasure to respond to inquiries in regard to any department of hospital work.

With kind regards, I am,

Yours very truly,

GEO. P. LUDLAM, *Superintendent.*

MOTOR AMBULANCES.

The following letter on Motor Ambulances (as figured) will be read with interest:—

New York,

February 20, 1904.

DEAR MR. REGINALD HARRISON,—Your letter of 2nd inst. duly received, and also the pamphlet on the Ambulance Service. I think there is nothing new in the situation here. The Ambulance Service has become so thoroughly incorporated into our hospital life and activity, and has so long passed its initial or preliminary stage, that there seems to be no room for growth or development. It is conducted along the same lines as during the past years, and if there has been any change

in methods, it has been in minor matters, which do not affect the general character of the service as you have described it in your pamphlet.

I think when I last wrote we were entertaining large expectations of the motor vehicle. These have not been realised. All of the hospitals, with one exception, which have the motor vehicles, still use them, but it is largely because they have them on hand. The mechanism is too delicate for such rough work, and the parts are constantly giving out, and frequent and costly repairs are necessary. One of the hospitals—the Roosevelt—has discontinued that part of their service and returned to the horse vehicle. I still have faith in the motor vehicle, but many improvements must be made before it will be sufficiently reliable to displace the horse ambulance.

It seems strange to me, so long accustomed to the ambulance as an indispensable feature of hospital work, that the hospital business of the great city of London can be conducted without it. It would seem as though the needs of the city demanded it, and if it were once introduced I am persuaded that you would soon find it difficult to believe that you could have transacted business so long without it.

With kind regards, I am,

Yours very truly,

GEO. P. LUDLAM, *Superintendent.*

A Note on the Conveyance of Invalids and Injured Persons by Sea.

DURING my long connection with the Port of Liverpool as Medical Officer of Quarantine to H.M. Customs (1864-1889), I was constantly brought in contact with persons arriving in ships from abroad who were suffering from diseases and injuries requiring careful removal by ambulance. These included a considerable number of naval and military invalids, which I was requested by the respective authorities to report upon to head-quarters. In the course of this experience I was often pained to hear of the serious damage that was inflicted on sick persons by the movements of the ship. I can recall many instances of fractured bones and inflamed joints, and in the case of females, miscarriages and childbirths, where the suffer-

ings of the individuals were greatly aggravated and added to in this way.

Some years ago (in 1878), when crossing from New York in a liner in very heavy weather, which continued throughout a protracted voyage, a sailor fractured both bones of his leg. The fracture, though simple, was what is technically called a very oblique one with pointed ends. In the course of a few days it was rendered compound, or open, by the ends of the bones being forced through the muscles and skin by the tremendous rolling of the ship. It was found absolutely impossible to restrain the movements of the bones by any contrivance, surgical or otherwise, that the surgeon of the ship or I could devise. On the patient being landed amputation of the leg was found unavoidable.

Again, more recently (1901), when crossing the Atlantic in the *Umbria*, and in a heavy sea, one of the officials of the ship (the interpreter) was thrown violently against a stanchion. I was asked by the doctor of the ship (whose name at this moment I forget) to assist him in examining the man. As he was in such great pain the doctor administered chloroform, whilst I examined

the injured limb and found that the hip was dislocated, and there was probably a fracture of the rim of the acetabulum, or socket. Reduction was effected and the natural form of the limb restored. This was done under great difficulties, as the man was carried into a room in the stern, where the pitching and rolling of the ship were greatly aggravated by the racing of the screw. Had I not been a very experienced sailor I should certainly have succumbed; as it was, one of the stewards remarked to me when, after an hour's work, we had placed the patient in his berth and secured him with sandbags and other appliances, "You look more like a patient yourself, sir, than a doctor."

If the weather had not moderated I do not know what would have happened to this man. Fortunately by the time the patient came fairly out of the anæsthetic we had run into smoother water, and the progress of the case was in every way satisfactory. Nothing could exceed the care and skill with which this man was landed and promptly conveyed to hospital by horse ambulance on our arrival at New York, and before I left for home I had the satisfaction of visiting and finding

him far advanced towards recovery. This was a good object lesson in practical surgery at sea.

I was much impressed with the difficulties referred to and illustrated in connection with the treatment of injured and sick persons at sea, arising out of the movements of the ship. After numerous trials and experiments—which several ship owners in Liverpool, including more particularly the Pacific Steam Navigation Company, whose voyages were of about six weeks' duration, allowed me to make—I succeeded in constructing a berth, which, for purely technical purposes I was advised to patent in February, 1885. The period covering the patent in this country has now expired, and I feel more at liberty to refer to it in the light of a surgical appliance, in which pecuniarily I can have no interest.

The apparatus is thus described* in the provisional specification.

“This invention has for its object the

* A copy of the specification, with drawings, may be obtained at the Patent Office. It is dated February 17 1885. Price 8d. “Improvements in Ships' Berths, Cattle Pens, and other Structures on Board Ship.” By Reginald Harrison.

increase of comfort or the lessening of the discomfort of passengers, horses, cattle, and the like at sea.*

“In carrying out my invention I support the berths, horse-boxes, and pens for cattle, sheep, and other animals on trunnions or their equivalents at each end, at points somewhat above the centre of gravity of the combined structure and its occupant. To effect this without the occupant receiving a pendulous motion, and to cause the suspension line and the centre line of the occupant or occupants to approximately coincide, I weight the lower side of the pen, berth or horse-box, in any convenient manner. By this means, while the centre line of the occupant is nearly on the suspension line, the centre of gravity of the entire mass is much below the said suspension line. The berth or other structure is always, therefore, strongly impelled to find its own level, and stand with its cross section in one constant position relative to the vertical, no matter at what angle the ship may roll.”

* For purposes of the patent, I was advised to include the conveyance of animals. I heard that a valuable race-horse was safely conveyed a long voyage in a berth constructed on my principle.

It will be recognised by those who have a practical acquaintance with the movements of ships at sea in all weathers, that they are of two kinds, namely, pitching and rolling, and combinations of these.

When taking my holidays, which have been frequently spent at sea, and included numerous voyages across the Atlantic, the Bay of Biscay and the Mediterranean, I have had many opportunities of watching the effects of the movements of the ship upon individuals and particularly upon invalids confined to their berths.

The conclusion arrived at is that if the rolling could be got rid of, most persons would soon learn to adapt themselves to that kind of pitching which the large passenger steamers, now commonly employed, sometimes indulge in. It is the long roll of the vessel, which never seems to end, that is so trying to endure.

There are many who can take exercise in an ordinary child's swing with impunity, but are at once nauseated when the body is subjected to a rolling or rotatory movement.

In the powerful steamers that are now used, the pitching movement is much lessened

by reason of the vessel being driven *through* the waves instead of over them, as is the case with smaller craft, whilst, though the rolling movement is in some degree restrained by side (or what are technically called, bilge) keels, it is the more disastrous of the two to the invalid or the injured traveller.

I claim for the berth described that it entirely protects the person from the rolling movement, and by so doing enables the occupant to more readily adapt himself to the pitching action of the vessel.

It may be urged that this berth has no advantage over the ordinary hammock that swings, and thus renders the patient uninfluenced by the roll of the ship. Apart from the inconvenience attendant upon invalids entering or leaving a swinging hammock, there is, from the shipowners' point of view, an objection to these which would limit their use.

My berth revolves on its circumference, and only occupies the space contracted for by the passenger when he pays his passage money. A swinging hammock requires a whole state room, and may therefore be said to take up four times the space of the berth.

By the kindness of the Pacific Steam Navigation Company, two or more of their ships were fitted with my berths, and were reported upon favourably by surgeons of the ships, as well as by passengers, who made use of them both for preventing sea-sickness and in cases of injury and disease. It is hardly necessary to quote letters testifying to the use of these berths, further than to say that they appear to have been universally appreciated, and have frequently been imitated. A letter from Dr. A. K. Watt, Surgeon of the s.s. *Liguria*, belonging to the Pacific Steam Navigation Company, says: "I am very pleased to tell you that I found your new berth very useful in a case of inflammation of the knee-joint and suppuration round it. It saved a good deal of suffering which otherwise the motion of the vessel must of necessity have caused, besides greatly assisting the treatment. It proved a great luxury to myself in bad weather, and a blessing and comfort to my patient."

